

## CLAIMS

The invention is claimed as follows:

1. An adjustable sprinkler connectable to a pressurized water source, said adjustable sprinkler comprising:
  - 5 an outer housing including inlet means for receiving the pressurized water;
  - an inner housing positioned within said outer housing and including a body and a head rotatably connected to the body, said head including outlet means for emitting the pressurized water received by said inlet means;
  - 10 setting means for setting the boundaries of a spray pattern, said setting means positioned inside said inner housing;
  - cover means for covering a top of said inner housing, said cover means defining an opening adapted to receive an adjuster for adjusting said setting means to change at least one of the boundaries of said spray pattern;
  - 15 rotating means for generating rotational movement to rotate the head about an axis in one direction and in an opposite direction between the boundaries of said spray pattern;
  - coupling means for coupling the rotating means to said head; and
  - resisting means for providing resistance to said coupling means, said
  - 20 resisting means being in frictional engagement with said coupling means, wherein said resisting means enables the coupling means to rotate with said

rotating means during normal operation and rotate independently from said rotating means if the head is manually rotated.

2. The adjustable sprinkler of Claim 1, which includes filtering means for  
5 filtering particles from said pressurized water positioned adjacent to said inlet means.

3. The adjustable sprinkler of Claim 1, wherein said outlet means includes a removable nozzle selected from a plurality of different removable nozzles.

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4. The adjustable sprinkler of Claim 1, wherein said setting means includes a first boundary adjustment means for setting the first boundary of the spray pattern and a second boundary adjustment means for setting the second boundary of the spray pattern.

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5. The adjustable sprinkler of Claim 4, wherein at least one of said first boundary adjustment means and said second boundary adjustment means includes control means for controlling the movement of said first and second boundary adjustment means, said control means adapted to receive said  
20 adjuster.

6. The adjustable sprinkler of Claim 1, wherein said cover means includes sealing means for sealing the opening.

7. The adjustable sprinkler of Claim 1, which includes reducing means for reducing the rate of the rotational movement generated by said rotating means, said reducing means being coupled to said rotating means.

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8. An adjustable sprinkler connectable to a pressurized water source, said adjustable sprinkler comprising:

an outer housing defining a water inlet;

an inner housing mounted in said outer housing, said inner housing  
10 including a body and a head rotatably connected to the body, said body being slideably connected to said outer housing;

a water outlet connected to said head;

a driver mounted in said head, said driver rotatable in one direction and  
in an opposite direction at a designated rate of rotation;

15 a reverser positioned adjacent to said driver, said reverser operable to change the direction of said driver;

a spray pattern controller coupled to the reverser, said spray pattern  
controller being adjustable to set a spray pattern having a first boundary and a  
second boundary, said spray pattern controller adapted to receive an adjuster  
20 controllable for adjusting at least one of said first and second boundaries of  
said spray pattern;

at least one resistor connected to an inside surface of said body; and

a reducer connected between said driver and a rotary output member, said reducer operable to rotate said rotary output member in the same direction as said driver and at a rate of rotation less than said rate of rotation of said driver, wherein said reducer is in frictional engagement with said resistor  
5 of said body to enable said reducer to rotate the head in unison with the rotation of said rotary output member and independently rotate the head separate from the rotation of the rotary output member if said head is manually rotated;

10 9. The adjustable sprinkler of Claim 8, which includes a screen mounted adjacent to the inlet.

10. The adjustable sprinkler of Claim 9, wherein said reverser includes:  
a retainer including a base, at least two fluid channels defined in said  
15 base, at least two fluid inlets connected to an end of said fluid channels and extending above said base and a pair of oppositely positioned support walls connected to and extending upwardly from said base, wherein each of said walls defines a plurality of slots;

a mounting member fixedly connected to said retainer, said mounting  
20 member including a hub and a pair of oppositely and diametrically positioned upwardly extending posts, each of said posts including a first and second surface;

an oscillator including a slot and two pairs of oppositely positioned fluid directing surfaces, each of said pairs of fluid directing surfaces adapted to direct the water received from the inlet against the impeller to cause the impeller to rotate, wherein the water directed from one of said pairs of fluid directing surfaces causes the impeller to rotate in one direction and the other of said pairs of fluid directing surfaces causes the impeller to rotate in an opposite direction; and

a lever positioned in said slot and adapted to pivot in said slot, said lever including first and second outwardly extending arms, each of said arms including a first and second surface, wherein when the lever pivots and causes the first surfaces of said arms to engage said first surfaces of the posts, the oscillator causes one of said pairs of fluid directing surfaces to direct water against the impeller, and when the lever pivots and causes the second surfaces of said arms to engage said second surfaces of the posts, the oscillator causes the other of said pairs of fluid directing surfaces to direct water against the impeller.

11. The adjustable sprinkler of Claim 8, wherein the reducer includes a gear housing having a plurality of planetary gears sequentially positioned and matingly engaged inside said gear housing.

12. The adjustable sprinkler of Claim 11, wherein the gear housing includes a first section having a first diameter and a second section including a second diameter, wherein said second diameter is greater than said first diameter and wherein, said second section is frictionally engaged with said resistor.

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13. The adjustable sprinkler of Claim 11, wherein the reducer includes a cover adapted to sealingly engage the bottom of the gear housing.

14. The adjustable sprinkler of Claim 8, which includes a cap removably  
10 mounted to said head, said cap defining an adjustment opening for receiving said adjuster.

15. The adjustable sprinkler of Claim 14, wherein said cap includes a top member and a bottom member, said bottom member fixedly mounted to said  
15 head, said top member adapted to be connected to said bottom member, wherein the connection of said top and bottom members defines said adjustment opening.

16. The adjustable sprinkler of Claim 15, wherein the top member of the  
20 cap includes a top surface having a plurality of indicators which indicate different spray patterns.

17. The adjustable sprinkler of Claim 8, wherein the spray pattern controller includes a first adjustment member fixable to set the first boundary of said spray pattern and a second adjustment member adjustable to set the second boundary of said spray pattern.

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18. The adjustable sprinkler of Claim 17, wherein the second adjustment member defines a slot which is adapted to matingly engage an end of said adjuster.

10 19. The adjustable sprinkler of Claim 8, wherein the resistor includes a longitudinal fin integrally formed on the inside surface of said body.

20. An adjustable sprinkler connectable to a pressurized water source, said adjustable sprinkler comprising:

an outer housing defining a water inlet;

an inner housing slideably connected to said outer housing, said inner  
5 housing including a body and a head rotatably connected to the body;

a nozzle connected to said head;

a driver mounted in said body, said driver rotatable in one direction and  
in an opposite direction;

a rotary output member rotatably connected to said driver and adapted  
10 to rotate in the same direction as the driver and at a rate of rotation that is less  
than the rate of rotation of said driver; and

a spray pattern controller mounted in said head, said spray pattern  
controller including a click set having a first adjustment member and a second  
adjustment member, said first adjustment member fixable to indicate a first  
15 boundary of a designated spray pattern and said second adjustment member  
movable to indicate a second boundary of the designated spray pattern; and

a cap adapted to sealingly engage the top of the head, said cap defining  
at least one adjustment opening which is adapted to receive an adjuster, said  
adjuster being controllable to adjust said second adjustment member.



21. The adjustable sprinkler of Claim 20, wherein said cap includes a top member and a bottom member, said bottom member fixedly mounted to said head, said top member connected to said bottom member, wherein the connection of said top and bottom members defines said adjustment opening.

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22. The adjustable sprinkler of Claim 21, wherein the top member of the cap includes a top surface having a plurality of indicators which indicate different spray patterns.

10 23. The adjustable sprinkler of Claim 20, wherein the head includes a nozzle retainer positioned adjacent to the nozzle and adapted to hold the nozzle in place.

24. The adjustable sprinkler of Claim 23, wherein the nozzle retainer  
15 includes a screw threadingly engaged with said head, wherein said screw is rotatable to position at least a portion of the screw in the water stream emitted by the nozzle to deflect the water stream.

25. The adjustable sprinkler of Claim 20, wherein said cap defines a second  
20 adjustment opening positioned adjacent to said screw, said second adjustment opening adapted to receive a different end of said adjuster and enable said adjuster to engage the screw.

26. The adjustable sprinkler of Claim 20, wherein said second adjustment member of said click set defines a slot adapted to be engaged by the adjuster.

27. An adjuster for adjusting a spray pattern for an adjustable sprinkler,  
5 wherein the adjustable sprinkler includes a head rotatably mounted to a body, a spray pattern controller mounted in the head and a nozzle retainer movably mounted in the head, wherein the spray pattern controller includes a first adjustment member and a second adjustment member, the first adjustment member fixable at assembly to indicate a first boundary of the spray pattern,  
10 the second adjustment member movable to indicate a second boundary of the spray pattern, said adjuster comprising:

an elongated body having a first end and a second end, said first end including a hub and at least one arm extending from said hub, said hub adapted to engage the spray pattern controller to hold the controller in place,  
15 said arm adapted to engage the second adjustment member to control the movement of said second adjustment member, said second end adapted to engage the nozzle retainer; and

a handle attached to said body.

20 28. The adjuster of Claim 27, wherein the handle includes a finger grip.

29. The adjuster of Claim 27, wherein the handle includes a plurality of finger grips.

30. An adjustable sprinkler connectable to a pressurized water source, said adjustable sprinkler comprising:

- an outer housing defining a water inlet;
- 5 an inner housing mounted in said outer housing, said inner housing including a body and a head rotatably connected to the body, said body being slideably connected to said outer housing;
- a water outlet connected to said head;
- a driver mounted in said head, said driver rotatable in one direction and
- 10 in an opposite direction at a designated rate of rotation;
- a reverser positioned adjacent to said driver, said reverser operable to change the direction of said driver;
- a coupling member centrally positioned in said head and said body, said coupling member coupled between said head and said reverser;
- 15 a spray pattern controller engageable with said coupling member to set the first and second boundaries of a spray pattern, said spray pattern controller having a non-engaging position and an engaging position relative to the coupling member, said non-engaging position adapted to cause the head to rotate in a continuous circular spray pattern, and said engaging position
- 20 adapted to enable the spray pattern controller to receive an adjuster controllable for adjusting at least one of said first and second boundaries to set a part circle spray pattern; and

a cap adapted to sealingly engage the top of the head, said cap defining at least one adjustment opening which is adapted to receive the adjuster, wherein said adjuster is inserted into the cap to cause said adjuster being controllable to adjust at least one of the first and second boundaries of said spray pattern.

31. The adjustable sprinkler of Claim 30, which includes a screen mounted adjacent to the inlet.

10 32. The adjustable sprinkler of Claim 30, wherein said reverser includes:

a retainer including a base, at least two fluid channels defined in said base, at least two fluid inlets connected to an end of said fluid channels and extending above said base and a pair of oppositely positioned support walls connected to and extending upwardly from said base, wherein each of said walls defines a plurality of slots;

a mounting member fixedly connected to said retainer, said mounting member including a hub and a pair of oppositely and diametrically positioned upwardly extending posts, each of said posts including a first and second surface;

20 an oscillator including a slot and two pairs of oppositely positioned fluid directing surfaces, each of said pairs of fluid directing surfaces adapted to direct the water received from the inlet against the impeller to cause the impeller to rotate, wherein the water directed from one of said pairs of fluid

directing surfaces causes the impeller to rotate in one direction and the other of said pairs of fluid directing surfaces causes the impeller to rotate in an opposite direction; and

a lever positioned in said slot and adapted to pivot in said slot, said  
5 lever including first and second outwardly extending arms, each of said arms including a first and second surface, wherein when the lever pivots and causes the first surfaces of said arms to engage said first surfaces of the posts, the oscillator causes one of said pairs of fluid directing surfaces to direct water against the impeller, and when the lever pivots and causes the second  
10 surfaces of said arms to engage said second surfaces of the posts, the oscillator causes the other of said pairs of fluid directing surfaces to direct water against the impeller.

33. The adjustable sprinkler of Claim 30, wherein the reducer includes a  
15 gear housing having a plurality of planetary gears sequentially positioned and matingly engaged inside said gear housing.

34. The adjustable sprinkler of Claim 33, wherein the gear housing includes a first section having a first diameter and a second section including a second  
20 diameter, wherein said second diameter is greater than said first diameter and wherein, said second section is adapted to frictionally engage at least one resistor connected to an inside surface of said body.

35. The adjustable sprinkler of Claim 33, wherein the reducer includes a cover adapted to sealingly engage the bottom of the gear housing.

36. The adjustable sprinkler of Claim 30, which includes a cap removably  
5 mounted to said head, said cap defining an adjustment opening for receiving said adjuster.

37. The adjustable sprinkler of Claim 36, wherein said cap includes a top member and a bottom member, said bottom member fixedly mounted to said  
10 head, said top member adapted to be connected to said bottom member, wherein the connection of said top and bottom members defines said adjustment opening.

38. The adjustable sprinkler of Claim 37, wherein the top member of the  
15 cap includes a top surface having a plurality of indicators which indicate different spray patterns.

39. The adjustable sprinkler of Claim 30, wherein the spray pattern controller includes a first adjustment member fixable to set the first boundary of  
20 said spray pattern and a second adjustment member adjustable to set the second boundary of said spray pattern.

40. The adjustable sprinkler of Claim 39, wherein the second adjustment member defines a slot which is adapted to matingly engage an end of said adjuster.